

Hazard Control Plan Cover Sheet

Work/Activity: Sampling and Sample Processing for the Facility Monitoring Program

Identification Number: LANL-RRES-ECO-SF-HCP/OP-011, R4

Author:

<u>Jack Nyhan</u>		
Name	Signature	Date

Initial Risk Level: Medium/Low

Consultation

☐ Not Required ☐ Required

Concurrence

☐ Not Required ☐ Required

<u></u>	<u></u>	<u></u>
Name (ECO Subject-Matter Expert)	Signature (as required)	Date

<u></u>	<u></u>	<u></u>
Name (Independent Peer)	Signature (as required)	Date

<u></u>	<u></u>	<u></u>
Safety Officer	Signature	Date

<u></u>	<u></u>	<u></u>
Team Leader	Signature	Date

Residual Risk Level: Minimal/Low

Authorization of Work:

<u></u>	<u></u>	<u></u>
Group or Deputy Group Leader	Signature	Date

Next Review Date:

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1.0 INTRODUCTION

1.1 Background A description of these Facility Monitoring Programs is provided in the Statements of Work (SOW) for Material Disposal Area G (Area G) at TA-54, the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility at TA-15, and the Plutonium Facility at TA-55. Sampling techniques are similar to those described in the Sediment, Soil, and Foodstuffs (produce) Monitoring Program portions of the Environmental Monitoring Plan for 1999–2001 (LA-UR-99-1117).

1.2 In this Document

This procedure addresses the following major topics:

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1.3 History of Revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	10/4/96	New document
1	3/99	Reformatted in accordance with LIR300-00-01, Safe Work Practices
2	4/01	Added new Section 9.0, Training
3	4/02	Change in directorate.
4	4/03	Team name change to Environmental Surveillance.

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2.0 PURPOSE

This Environmental Surveillance Team procedure describes the process for collecting and preparing soil, sediments, and vegetation samples as part of the Facility Monitoring Program, as mandated by DOE Order 5400.1, 5400.5, and DOE Mitigation Action Plan (40 CFR 1500.2 [f]).

3.0 SCOPE

This procedure applies to any individual assigned to collect soil, sediments, and vegetation as part of the Facility Monitoring Program. The principle investigator (PI) is Jack Nyhan. The lead technician is Rick Velasquez.

4.0 DEFINITIONS

4.1 Terms

Soil: Surface soil includes material from the 5-cm (0- to 2-in.) depth.

Composite samples: Samples composed of the five sub-samples taken from an area.

Grab samples: A single sample taken from a specific location at a given point in time.

Sediments: Surface runoff material from ephemeral and perennial stream bottoms.

Vegetation: Top growth material of plants.

5.0 RESPONSIBILITIES

5.1 Principal Investigator

PIs are responsible for

- Defining the components of and the processes associated with the work in sufficient detail to enable hazards to be identified and adequately controlled;
 - Determining required training for workers;
 - Ensuring that assigned workers are trained and meet authorization to work standards; and
 - Ensuring that workers have the knowledge, skills, and abilities needed to perform the work safely.
-

5.2 Workers

Workers, with assistance as needed, are responsible for

- Identifying and evaluating the hazards associated with the work, as necessary, to ensure that the controls are adequate to perform the work safely;
- Defining, establishing, and maintaining, as assigned, a hazard-control system that effectively mitigates the hazards associated with the work and meets institutional and facility requirements;
- Determining that the work has been authorized before proceeding with it;
- Acquiring the knowledge and skills needed to perform the work;
- Obtaining and maintaining authorization to perform the work;
- Understanding and following all operational requirements and restrictions related to the work;

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5.0 RESPONSIBILITIES (cont.)

5.2 Workers

Workers, with assistance as needed, are responsible for

- Performing the work safely;
 - Improving the safety of the work by reviewing the work, commensurate with the level of risk, and incorporating lessons learned;
 - Using an appropriate change-control process to document and communicate changes made in the hazard control system; and
 - Stopping the work if it seems to be unsafe.
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5.3 Line Managers/ Supervisors

Line managers/supervisors are responsible for

- Defining the scope of work;
 - Ensuring that an effective hazard-control system is established to reduce the risk posed by the work to an acceptable level;
 - A periodic review of the process used to assign and mitigate initial risk;
 - Ensuring that institutional and facility requirements and restrictions on the work are followed;
 - Authorizing the defined work, when the risk has been controlled to an acceptable level;
 - Authorizing workers to perform the work, after they have documented adequate knowledge, skills, and abilities;
 - Ensuring that workers perform the work safely;
 - Improving the safety of the work by reviewing the work, commensurate with the level of risk, and ensuring the incorporation of lessons learned; and
 - Ensuring that an appropriate change-control process is used to document and communicate changes made in the hazard-control system.
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5.4 Subject Matter Experts

Not applicable to the procedures described in this document.

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6.0 PRECAUTIONS AND LIMITATIONS

This document establishes the basic requirements for sampling and processing of samples for the Facility Monitoring Program. This procedure applies to all personnel performing field procedures described in this document. Work performed under this procedure by LANL personnel will occur only after all other applicable procedures have been reviewed and signed as listed under Section 7.0 of this document.

Training for this procedure is completed in two sessions: “self-study” (reading) of this operating procedure and “on-the-job training” by a previously trained member of the Environmental Surveillance Team. At the completion of the “self-study” portion, the trainee must sign the sign-off sheet (as well as the supervisor) at the end of this procedure (Attachment 4). When the trainee shows competence in the “on-the-job training” portion of this procedure, the supervisor will authorize the trainee's participation in the activity by signing the last line on Attachment 4.

7.0 SAFE WORK PRACTICE REQUIREMENTS

7.1 Define the Work: Sampling Information

Types of Samples Collected - Sampling occurs at three sites, Area G (TA-54), DARHT (TA-15), and the Plutonium Facility (TA-55), where three types of samples are collected:

- soil,
- sediments, and
- vegetation: understory (grasses, forbs, and/or shrubs) and overstory (tree).

Number of samples - The following table indicates the number of composite (c) or grab (g) samples that should be collected from each area. These numbers may vary according to funding provided by the customer. Drought conditions may also reduce the number of vegetation samples that can be collected.

	TA-54	TA-15	TA-55
Soil	9 (c)	4 (c)	4 (c)
Sediment	N/A	4 (g)	
Vegetation	19 (c)	8 (c)	4 (c)

Collection of Soil Samples

Equipment Needed - Additional specific equipment required for going into the field is given in the operating procedure “General Field Work” (LANL-RRES-ECO-HCP/OP-001).

The following equipment is required for soil sampling:

- safety glasses and a hat
- rubber gloves and safety/field shoes
- stainless steel soil ring (10-cm diameter), top, and ring spatula
- 3-lb hammer
- soap/water solution (for washing the ring), water (for rinsing), paper towels
- 500-ml polyethylene bottles (500-mL and 125-mL; one for each composite sample)
- ice chest with ice
- zip-lock bags (gallon size) and marker for labeling
- chain-of-custody forms and tape (see procedure LANL-RRES-ECO-HCP/OP-SF-008 and Attachment 1)

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collecting the Samples - Sampling guidelines set by the American Society for Testing and Materials (ASTM) were used to develop the guidelines followed by the Environmental Surveillance Team. Each year, plan sampling trips to each location and perform the following steps:

Step	Action
1	Follow the procedure governing general field work (LANL-RRES-ECO-HCP/OP-001). Check the condition of the vehicle and the fuel level before leaving for the field.
2	Locate the center of the sampling area, and place a clean 10-cm- (4-in.-) diameter stainless steel ring on the surface (see Attachment 2). Cover the ring with the stainless steel top.
3	Using a 3-lb hammer, drive the stainless steel ring 5 cm (2 in.) deep into the ground at the center and corners of a square area, 10 m (33 ft) per side. After driving the ring-sampler at a point, remove soil next to the soil ring-sampler, slip the spatula underneath the ring, and lift the sample. Place each of the five sub-samples into a 1-gallon zip-lock bag.
4	Thoroughly mix the sub-samples in the zip-lock bag to form a composite sample. Pour the composite into a 125-mL polyethylene bottle (for heavy metal sampling) and a 500-mL poly bottle (for radionuclide sampling).
5	Seal each bottle with chain-of-custody tape. Label the bottle with the sample location, date, time, and your initials. Place each bottle into a 1-gallon zip-lock bag.
6	Place the bags in the cooler with ice for transport back to the Laboratory. Complete a chain-of-custody form (Attachment 1) with the appropriate sampling information, and follow applicable chain-of-custody procedures for samples (refer to LANL-RRES-ECO-HCP/OP-SF-008) until submitted to an analytical laboratory for analysis. We currently employ Paragon Analytics, Inc., Fort Collins, CO.
7	Wash ring, spatula, and top with the soap/water solution, rinse with water, and then dry with paper towels.
8	Once at the lab, store the samples on ice or in a freezer until they are submitted to Paragon Analytics, Inc., (normally within two working days).

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collection of Sediment Samples Equipment Needed - Additional specific equipment required for going into the field is given in the operating procedure "General Field Work" (LANL-RRES-ECO-HCP/OP-001).

The following equipment is required for sediment sampling:

- safety glasses and a hat
- rubber gloves and safety/field shoes
- disposable polyethylene scoops
- 500-ml and 125-mL polyethylene bottles (one for each composite sample)
- ice chest with ice
- zip-lock bags (gallon size) and marker for labeling
- chain-of-custody forms and tape (see procedure LANL-RRES-ECO-HCP/OP-SF-008 and Attachment 1)

Step	Action
1	Follow the procedure governing general field work (LANL-RRES-ECO-HCP/OP-001). Check the condition of the vehicle and the fuel level before leaving for the field.
2	Locate the sampling areas. Using a disposable polyethylene scoop, collect sediments to a depth of 5 cm (2 in.) in both a 125-mL (for heavy metal sampling) and a 500-mL (for radionuclide sampling) polyethylene bottle. <ul style="list-style-type: none">• perennial streams: sample in dune buildup behind boulders in the main channel• ephemeral streams: sample in the center of the main channel
3	Seal each bottle with chain-of-custody tape. Label the bottle with the sample location, date, time, and your initials. Place each bottle into a 1-gallon zip-lock bag.
4	Place the bags in the cooler with ice for transport back to the Laboratory. Complete a chain-of-custody form (Attachment 1) with the appropriate sampling information, and follow applicable chain-of-custody procedures for samples (refer to LANL-RRES-ECO-HCP/OP-SF-008) until submitted to an analytical laboratory for analysis.
5	Once at the lab, store the samples on ice or in a freezer until they are submitted to Paragon Analytics, Inc., (normally within two working days).

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Collection of Vegetation Samples

Equipment Needed - Additional specific equipment required for going into the field is given in the operating procedure "General Field Work" (LANL-RRES-ECO-HCP/OP-001).

The following equipment is required for vegetation sampling:

- safety glasses and a hat
- rubber gloves and safety/field shoes
- gardening shears
- ice chest with ice
- zip-lock bags (gallon size) and marker for labeling
- chain-of-custody forms (see procedure LANL-RRES-ECO-HCP/OP-SF-

008 and Attachment 1)

Step	Action
1	Follow the procedure governing general field work (LANL-RRES-ECO-HCP/OP-001). Check the condition of the vehicle and the fuel level before leaving for the field.
2	Collect approximately three pounds of vegetation and place into a zip-lock bag. Label the bag with the sample location, date, time, and your initials.
3	Place the bags in the cooler with ice for transport back to the Laboratory. Complete a chain-of-custody form (Attachment 1) with the appropriate sampling information, and follow applicable chain-of-custody procedures for samples (refer to LANL-RRES-ECO-HCP/OP-SF-008) until submitted to Paragon Analytics, Inc., for analysis.
4	Once at the Lab, store the samples on ice or in a freezer until they are processed (normally within two working days).

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Vegetation Samples

Equipment Needed - The following equipment is required for processing the samples:

- safety glasses and safety shoes
- lab coat and rubber gloves
- cutting boards, knives, and cut-resistant gloves
- balance
- glass beakers (50-mL, 100-mL, 1-L, and 2-L volumes; one for each sample)
- aluminum foil
- hot-mitts/pot holders
- hot plate
- watch glass (one for each tritium sample)
- plastic wrap (*e. g.*, Saran wrap™)
- ice cubes
- small paper bags (*i. e.*, lunch bags; one for each sample)
- Wiley mill with a 40-mm screen
- drying and ashing ovens
- polyethylene bottles (20-mL and 500-mL volumes; one for each sample)
- zip-lock bags and labeling pens
- chain-of-custody tape

Sample Processing - Within two days of collection, process the samples by following the steps below:

Step	Action
1	Separate collected vegetation by variety, assembling composite samples of each type of vegetation. Cut or break vegetation into smaller pieces to facilitate handling.
2	Assign ID numbers to samples, and label 1-L and 2-L beakers, poly-bottles, and bags with these numbers. Larger bags used for submitting samples should be labeled with sample location, date, time, and then initialed.
3	Remove a subsample of vegetation from each composite for analysis of tritium, and place in 1-L sample beakers, as described in step 4.
4	<p>To obtain samples for tritium analysis, follow the steps below (refer to Attachment 3 for schematic of distillation setup):</p> <ul style="list-style-type: none">• Begin by placing a 100-mL beaker upside-down in the center of a 1-L sample beaker, with a 50-mL beaker right-side-up on top of it. Then place vegetation in the beaker.• Cover the top of the large beaker with a watch glass and seal with plastic wrap.• To aid in condensation of the water-sample, fill the 50-mL beaker with ice and place it on top of the watch glass.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Vegetation Samples (cont.) Sample Processing - Within two days of collection, process the samples by following the steps below:

Step	Action
4	<p>To obtain samples for tritium analysis, follow the steps below (refer to Attachment 3 for schematic of distillation setup):</p> <ul style="list-style-type: none">• Place the sample on a hot plate, warming at a low temperature until water begins to condense on the watch glass. Be certain that the condensation drips into the 50-mL sampling beaker. CAUTION!! Hot plate and glassware will become hot! Use care when handling these items.• Collect about 10-mL of distillate from each sample, and carefully place sample into labeled 20-mL polyethylene bottles.• Seal each bottle with chain-of-custody tape, and record each sample on the appropriate chain-of-custody form.• Place all tritium samples and the chain-of-custody form into a labeled zip-lock bag and refrigerate until samples are submitted to an analytical laboratory.
5	<p>To obtain samples for heavy-metal analysis:</p> <ul style="list-style-type: none">• Remove approximately 100 g (fresh weight) of vegetation from the composite. Place samples into labeled paper bags. Dry the samples in the oven at 75°C for 48 hours.• Remove the vegetation from the oven, and grind each sample through a 40-mm screen using the Wiley mill. Training on operation of the mill will be hands-on by a previously trained member of the Environmental Surveillance Team.• Place ground samples of vegetation into labeled 20-mL polyethylene bottles, and then seal the bottles with chain-of-custody tape.• Record all samples on a chain-of-custody form, and then place all samples for heavy metals into a labeled zip-lock bag until submitted to Paragon Analytics, Inc.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Processing of Vegetation Samples (cont.) Sample Processing - Within two days of collection, process the samples by following the steps below (cont.):

Step	Action
6	<p>All remaining samples will be used for radiochemistry analysis. CAUTION!! During drying and ashing procedures, ovens and glassware will become hot! Use care when handling these items.</p> <p>Prepare the sample beakers:</p> <ul style="list-style-type: none">• Weigh the 2-L beaker to determine the tare weight and record this value in the laboratory notebook.• Place approximately 500 to 2000 g of vegetation into labeled 2-L tared beakers and weigh to the nearest 0.01 g to determine gross weight. Split a large sample into two beakers to serve as replicates for analysis.• Record the fresh weight of the samples (subtract the tare weight from the gross weight) in the laboratory notebook. <p>Dry the samples:</p> <ul style="list-style-type: none">• Cover each beaker with vented aluminum foil and place in the drying oven, carefully noting the placement-order of the beakers in the lab notebook.• Dry the vegetation in the beakers at about 75°C for 5 days.• After the fifth day, weigh the samples to the nearest 0.01 g. Continue drying and weighing the beakers each day until sample weights are constant (+10%) in two successive weighings.• When the samples are dry, remove them from the oven and weigh them to the nearest 0.01 g. Subtract the original tare weight from this gross weight to calculate the dry weight of each sample. Enter this data in the laboratory notebook. <p>Ash the samples:</p> <ul style="list-style-type: none">• Place samples in the ashing oven, <u>carefully noting placement of beakers</u>, and ash the samples for 5 days. During ashing, raise the temperature step-wise from 75°C to 500°C to avoid explosive combustion of the organic materials in the early stages of the process.• After ashing is complete, cool samples to 75°C and reweigh the samples to the nearest 0.01 g. Calculate ash weights by subtracting tare weights from gross ash-weights. Record ash weights in the lab notebook.• Transfer each ash sample to a 500-mL polyethylene bottle and label the bottle.• Seal the bottles with chain-of-custody tape and record samples on a chain-of-custody form. Place all samples in a labeled zip-lock bag to be turned over to an analytical laboratory with the appropriate form.

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

Submitting of Samples Submitting of Samples for Analysis - Submit all samples to a chemistry group for tritium, heavy metal, and radiochemical analyses.

Request the following analyses on the appropriate chain-of-custody forms:

SOIL AND SEDIMENTS:

- analysis of tritium content; reported in pCi/L of moisture
- analysis of the following heavy metals: Ag, As, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, Tl, and Zn (plus any others on EPA's Target Analyte List); reported in µg/g (dry weight)
- analysis of the following radionuclides: strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241; reported in pCi/g (dry weight)
- analysis of total uranium; reported in µg/g (dry weight)

VEGETATION:

- analysis of tritium content in liquid samples; reported in pCi/L of tissue moisture
- analysis of the following heavy metals from dried/ground samples: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl (plus any others on EPA's Target Analyte List); reported in µg/g (dry weight)
- analysis of the following radionuclides from ashed samples: strontium-90, cesium-137, plutonium-238, plutonium-239/240, and americium-241; reported in pCi/g ash
- analysis of total uranium; reported in µg/g ash

7.2 Identify and Evaluate Hazards

Hazard

Initial Risk Level based on Severity and Likelihood

In the Field:

A) Off-road automobile accidents and tripping or falling hazards	LOW
B) Sampling of SWMU sites	LOW
C) Wildlife encounters (plague, hantavirus, ticks, etc.)	LOW
D) Environmental hazards (weather)	LOW
E) Lifting and moving heavy items	LOW

In the Laboratory

F) Use of electrical appliances (hot plates and ovens)	LOW
G) Hot and/or broken glass	LOW
H) Splattering of hot water	LOW
I) Drying and ashing ovens	LOW
J) The Wiley Mill	LOW
K) Use of knives	LOW
L) Repetitive motion and other ergonomic hazards	LOW

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

7.3 Develop and Implement Controls

7.3.1 Development

<u>Hazard</u>	<u>Hazard Control</u>	<u>Residual Risk Level</u>
A Off-road automobile accidents and tripping or falling hazards	LANL personnel will follow operating procedures discussing off-road vehicle use and tripping or falling hazards. Appropriate footwear and clothing will be worn by all LANL personnel. Personnel will have first aid/CPR training.	MINIMAL
B Sampling of SWMU sites	The following safety/personal protective equipment will be worn: LEVEL 4 PPE (safety glasses, safety/field shoes, rubber gloves, and a hat).	MINIMAL
C Wildlife encounters (plague, hantavirus, ticks, etc.)	In accordance with recommendations set by the State of New Mexico Environmental Department, all personnel should wear long pants, long-sleeved shirts, and insect repellent. Do not handle dead or sick rodents. When you have returned from the field, perform a self-check for the presence of ticks.	MINIMAL
D Environmental hazards (weather)	LANL personnel will cease operations during inclement weather as described in RRES-ECO operating procedures for conducting general fieldwork. All work will be performed within a safe distance to vehicles. The distance will be based on current field conditions and terrain with respect to current and expected weather conditions.	MINIMAL
E Lifting and moving heavy items	Use carts or dollies. Use a helper.	MINIMAL
F Use of electrical appliances (hot plates and ovens)	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves. Be familiar with the operator's manuals for each piece of equipment.	MINIMAL
G Hot and/or broken glass	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves.	MINIMAL
H Splattering of hot water	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves.	MINIMAL

7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

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7.3.1 Development (cont.)	<u>Hazard</u>	<u>Hazard Control</u>	<u>Residual Risk Level</u>
	I Drying and ashing ovens	Make sure samples are cooled to 75°C. Use hot-mitts or pot holders when working with the ovens, hot-plates, or hot beakers.	MINIMAL
	J The Wiley Mill	Wear safety glasses, lab coat, steel-toe safety shoes, and rubber gloves. Be familiar with the operator's manuals when grinding samples. Make sure that the power to the Wiley Mill is off before cleaning it.	MINIMAL
	K Use of knives	When knives are being used, wear safety glasses, lab coat, steel-toe safety shoes, and cut-resistant gloves to prevent injuries.	MINIMAL
	L Repetitive motion and other ergonomic hazards.	Take a short break every hour.	MINIMAL
7.3.2 Documentation	All personnel assigned to participate in sampling and sample processing will have read this hazard control plan/operating procedure and will have signed an acknowledgment (Attachment 4). Any future changes to this operating procedure will be properly documented and will be reflected by the revision number that is included with the document identification number.		
7.3.3 Authorization of Work	All LANL workers involved with this activity will obtain authorization from their direct supervisor, group leader, or deputy group leader. No work will be performed until this authorization has been granted. The residual risk level for performing activities related to this activity have been determined based on consultation with subject matter experts experienced in sampling procedures. All work related to this activity will be reviewed, at a minimum, on an annual basis, and this document updated to reflect changes as deemed necessary.		
7.3.4 Authorization of Workers	LANL workers will be granted authorization to perform this work only after they have reviewed all appropriate required documentation and training that applies to LANL personnel.		
7.4 Perform Work Safely	All personnel involved with this activity will adhere to all safety guidelines and procedures as described in the appropriate documents, including this document. Contractor personnel will be responsible for ensuring self-readiness checks before performing the work. LANL personnel will perform self-readiness checks before performing fieldwork. Field conditions, including weather conditions, will be evaluated as to the effect they will have on performing field activities safely. If activities can not be performed safely, all activities will cease until such time the LANL project leader authorizes work to resume.		

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7.0 SAFE WORK PRACTICE REQUIREMENTS (cont.)

7.5 Provide Feedback and Continuous Improvement At a minimum, the activity described in this document will be evaluated annually. If any changes are made to the procedure, those changes will be evaluated as to whether or not they may introduce new hazards. Any new hazards will be evaluated and appropriate controls implemented to reduce their risk to an acceptable level. A periodic review with project personnel will be made to evaluate the accuracy of this document with respect to field operations.

8.0 RISK DETERMINATION

The determination of risk for each activity described in this document was based on the Risk Determination matrix given in LIR300-00-01, Safe Work Practices.

9.0 TRAINING

The following training must be completed and confirmed by the PI of the project before work can begin:

For each worker:

- General Field Work HCP/OP (LANL-RRES-ECO-HCP/OP-001) must be read and documented.
- Thermal Stress Awareness Training must be taken when it becomes available

For each field crew:

- At least two people must have current First Aid Training.
 - At least two people must have current CPR Training.
 - Members must have site-specific training as required by the location where work is occurring.
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10.0 REFERENCES

10.1 Source Documents Documentation and additional training referenced in section 7.3.1 (hazard controls) include the following:

- LANL-RRES-ECO-HCP/OP-001, "General Field Work"
- LA-UR-99-1117, "Environmental Monitoring Plan"
- LANL-RRES-ECO-HCP/OP-SF-008, "Chain-of-custody for Environmental Samples"
- "Standard practice for sampling surface soil radionuclides," Annual Book of ASTM Standards, American Society for Testing and Materials, Philadelphia, PA, 1990.
- SOW: Kathryn Bennett, "Statement of Work for ESH-20." LANL Memorandum ESH-20/EARE-95-0120 to Eric Vold and Charles Puglisi, CST-14 (November 13, 1995).
- SOW: Phil Fresquez, "Study Plan for Soil, Plant, and Biota Contaminant Monitoring at DARHT." LANL Memorandum ESH-20/Ecol-96-0657 to Todd Haagenstad, ESH-20 (May 6, 1996)
- SOW: Phil Fresquez, "Proposed environmental surveillance activities and breakdown of costs for Area G work by ESH-20 during 1996." LANL Memorandum ESH-20/EARE-96-0074 to Tony Stanford, CST-14 (October 26, 1996)

Sampling and Sample Processing for the Facility Monitoring Program

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Approval Date: 04/03

10.2 Document Coordination RRES-ECO (Ecology Group) of the Risk Reduction and Environmental Stewardship Division is the group of institutional coordination responsible for developing, revising, and maintaining the contents of this document.

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Attachment 1

[illegible]

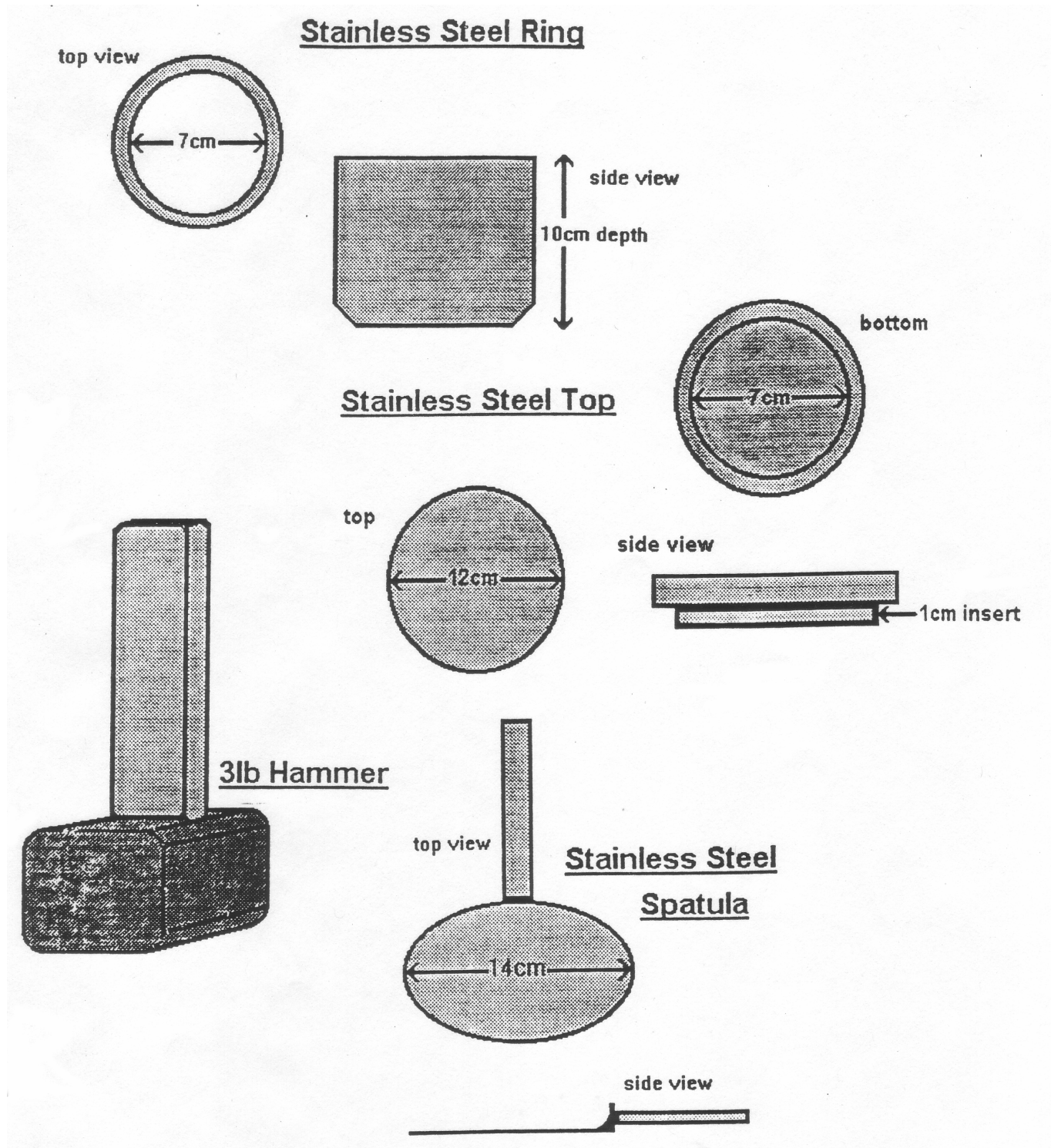
Sampling and Sample Processing for the Facility Monitoring Program

Los Alamos National Laboratory

LANL-RRES-ECO-SF-HCP/OP-011, R4

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ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM



Sampling and Sample Processing for the Facility Monitoring Program

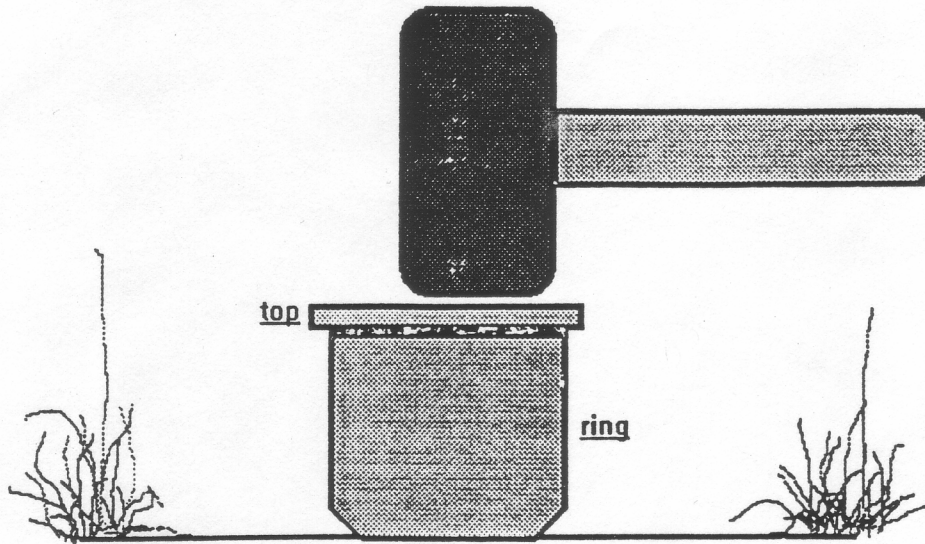
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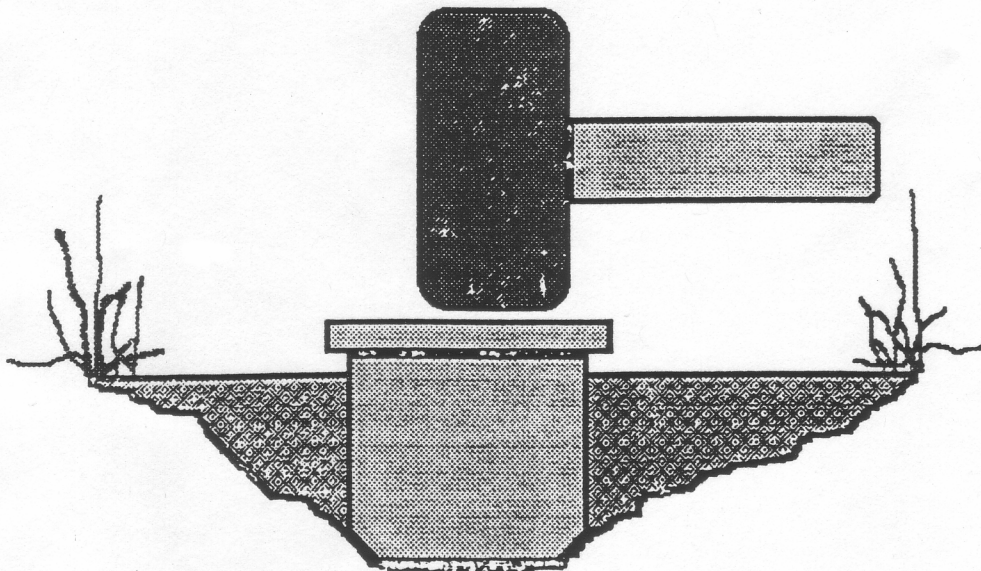
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ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM

Step 1. place ring on soil and start hammering



Step 2. hammer ring into soil



Sampling and Sample Processing for the Facility Monitoring Program

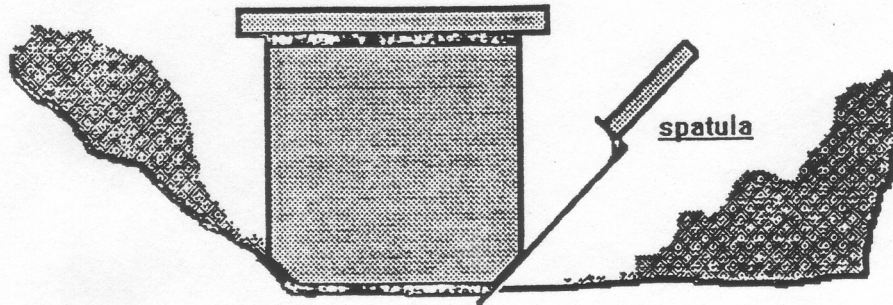
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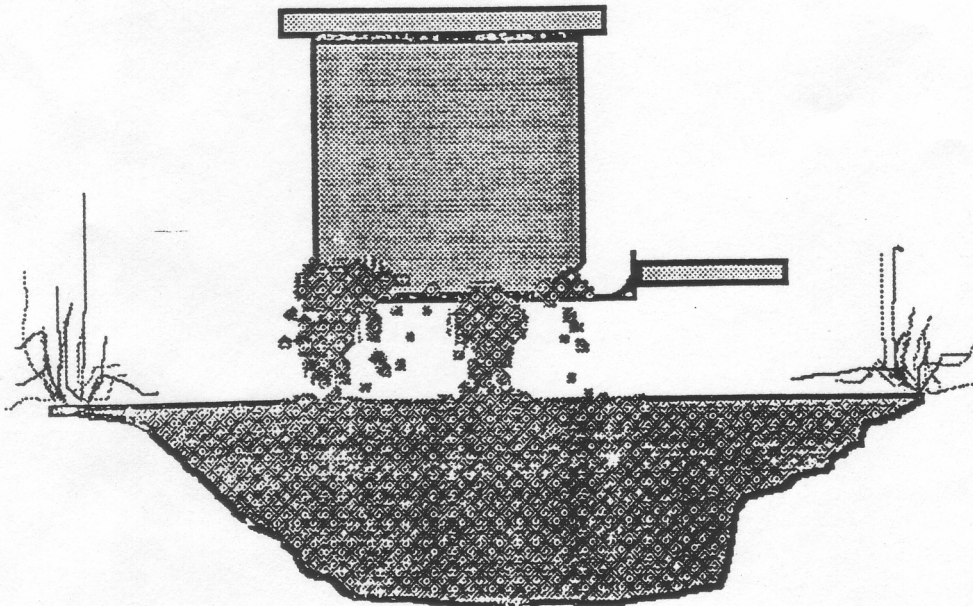
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ATTACHMENT 2: SOIL SAMPLING EQUIPMENT AND DIAGRAM

Step 3. remove soil from surrounding of ring with spatula



Step 4. remove ring from soil with spatula and place soil into a sampling bag



Sampling and Sample Processing for the Facility Monitoring Program

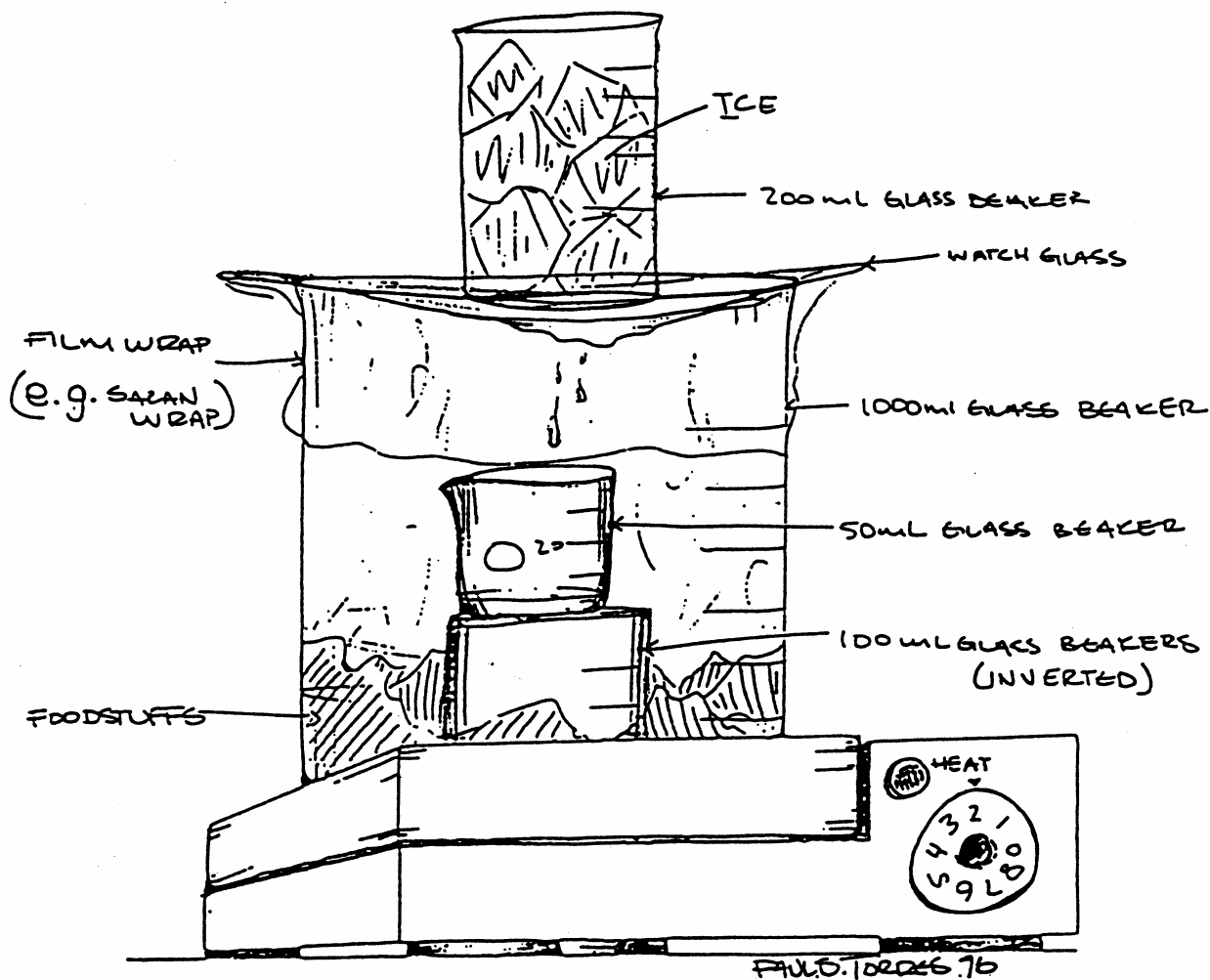
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ATTACHMENT 3: SCHEMATIC OF DISTILLATION SETUP

(For processing samples for tritium analysis)



Sampling and Sample Processing for the Facility Monitoring Program

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Attachment 4

Training Documentation Sheet

Hazard Control Plan/Operating Procedure for Sampling and Sample Processing for the Facility Monitoring Program

I, the undersigned, have read and fully understand the Hazard Control Plan/Operating Procedure for Sampling and Sample Processing for the Facility Monitoring Program.

Trainee

Signature _____ Date _____

Print Name _____

Self-study training _____ Date _____
Supervisor's Signature

On-the-job training _____ Date _____
(as required) Supervisor's Signature